ABSTRACT

In a dual polymetal gate electrode, the contact resistance at the interface of silicon films increases due to mutual-diffusion of impurities of p-type and n-type silicon films through a refractory metal and metal nitride deposited thereon. A way of inhibiting the phenomenon is carbon implantation into a refractory metal and refractory metal nitride on the boundary of p-type silicon and n-type silicon, cutting the path, or isolating it by an insulator. Thereby, mutual-diffusion of impurities through a refractory metallic film and nitride film of refractory metal is inhibited, resulting in an increase in the contact resistance of metal nitride film and silicon film and a decrease in the deviation of threshold voltage of the MISFET.